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RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/940,673

DATE: 09/26/2001

TIME: 12:31:54

Input Set : N:\Crf3\RULE60\09940673.txt

Output Set: N:\CRF3\09262001\I940673.raw

#2

SEQUENCE LISTING

3 (1) GENERAL INFORMATION:

- 5 (i) APPLICANT: Gorski, David H.
- 6 Walsh, Kenneth
- 8 (ii) TITLE OF INVENTION: Growth Arrest Homeobox Gene
- 10 (iii) NUMBER OF SEQUENCES: 19
- 12 (iv) CORRESPONDENCE ADDRESS:
- 13 (A) ADDRESSEE: Calfee, Halter, and Griswold
- 14 (B) STREET: 800 Superior Avenue
- 15 (C) CITY: Cleveland
- 16 (D) STATE: Ohio
- 17 (E) COUNTRY: U.S.A.
- 18 (F) ZIP: 44114-2688

ENTERED

20 (v) COMPUTER READABLE FORM:

- 21 (A) MEDIUM TYPE: Floppy disk
- 22 (B) COMPUTER: IBM PC compatible
- 23 (C) OPERATING SYSTEM: PC-DOS/MS-DOS
- 24 (D) SOFTWARE: PatentIn Release #1.0, Version #1.25

26 (vi) CURRENT APPLICATION DATA:

- C--> 27 (A) APPLICATION NUMBER: US/09/940,673
- C--> 28 (B) FILING DATE: 27-Aug-2001
- 29 (C) CLASSIFICATION:

31 (vii) PRIOR APPLICATION DATA:

- 32 (A) APPLICATION NUMBER: 09/078,465
- 33 (B) FILING DATE: 23-SEPT-1997

35 (viii) ATTORNEY/AGENT INFORMATION:

- 36 (A) NAME: Golrick, Mary E.
- 37 (B) REGISTRATION NUMBER: 34829
- 38 (C) REFERENCE/DOCKET NUMBER: 22311/00114

40 (ix) TELECOMMUNICATION INFORMATION:

- 41 (A) TELEPHONE: (216) 622-8200
- 42 (B) TELEFAX: (216) 241-0816
- 43 (C) TELEX: 980499

46 (2) INFORMATION FOR SEQ ID NO: 1:

48 (i) SEQUENCE CHARACTERISTICS:

- 49 (A) LENGTH: 2244 base pairs
- 50 (B) TYPE: nucleic acid
- 51 (C) STRANDEDNESS: both
- 52 (D) TOPOLOGY: linear

54 (ii) MOLECULE TYPE: cDNA

56 (iii) HYPOTHETICAL: NO

58 (iv) ANTI-SENSE: NO

61 (ix) FEATURE:

- 62 (A) NAME/KEY: CDS
- 63 (B) LOCATION: 197..1108

66 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

68 GTCAAGTGT TATACGTGCA GGAGACTGGC CGCTCGGCTC AGGACTGGGA TTAGCGGGCT

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70 CTGCTCAAAC CCGCGCGGCT TTTACATTAG GAGTGAGTGG GGGAGAGTCC TAGGATTTCT      120
72 AGTGAAAAGT GACAGCGCTT GGTGGACTTT GGGACCTTCG TGAAGTCTTC TGCTTGAAG      180
74 CTGAGACTTG CATGCC ATG GAA CAC CCC CTC TTT GGC TGC CTG CGC AGC      229
75           Met Glu His Pro Leu Phe Gly Cys Leu Arg Ser
76           1           5           10
78 CCC CAC GCC ACA GCG CAA GGC TTG CAC CCC TTC TCG CAG TCT TCT CTG      277
79 Pro His Ala Thr Ala Gln Gly Leu His Pro Phe Ser Gln Ser Ser Leu
80           15           20           25
82 GCC CTC CAT GGA AGA TCT GAC CAC ATG TCC TAC CCC GAA CTC TCC ACA      325
83 Ala Leu His Gly Arg Ser Asp His Met Ser Tyr Pro Glu Leu Ser Thr
84           30           35           40
86 TCT TCC TCG TCT TGC ATA ATC GCG GGA TAC CCC AAT GAG GAG GGC ATG      373
87 Ser Ser Ser Ser Cys Ile Ile Ala Gly Tyr Pro Asn Glu Glu Gly Met
88           45           50           55
90 TTT GCC AGC CAG CAT CAC AGG GGG CAC CAC CAC CAC CAC CAC CAC CAC      421
91 Phe Ala Ser Gln His His Arg Gly His His His His His His His His
92 60           65           70           75
94 CAT CAC CAC CAC CAG CAG CAG CAG CAC CAG GCT CTG CAA AGC AAC TGG      469
95 His His His His Gln Gln Gln Gln His Gln Ala Leu Gln Ser Asn Trp
96           80           85           90
98 CAC CTC CCG CAG ATG TCC TCC CCG CCA AGC GCG GCC CGG CAC AGC CTT      517
99 His Leu Pro Gln Met Ser Ser Pro Pro Ser Ala Ala Arg His Ser Leu
100           95           100           105
102 TGC CTG CAG CCT GAT TCC GGA GGG CCC CCG GAG CTG GGG AGC AGC CCT      565
103 Cys Leu Gln Pro Asp Ser Gly Gly Pro Pro Glu Leu Gly Ser Ser Pro
104           110           115           120
106 CCG GTC CTG TGC TCC AAC TCT TCT AGC CTG GGC TCC AGC ACC CCG ACC      613
107 Pro Val Leu Cys Ser Asn Ser Ser Ser Leu Gly Ser Ser Thr Pro Thr
108           125           130           135
110 GGA GCC GCG TGC GCA CCA AGG GAT TAT GGC CGT CAA GCG CTG TCA CCC      661
111 Gly Ala Ala Cys Ala Pro Arg Asp Tyr Gly Arg Gln Ala Leu Ser Pro
112 140           145           150           155
114 GCA GAA GTG GAG AAG AGA AGT GGC AGC AAA AGA AAA AGC GAC AGT TCA      709
115 Ala Glu Val Glu Lys Arg Ser Gly Ser Lys Arg Lys Ser Asp Ser Ser
116           160           165           170
118 GAT TCC CAG GAA GGA AAT TAC AAG TCA GAA GTG AAC AGC AAA CCT AGG      757
119 Asp Ser Gln Glu Gly Asn Tyr Lys Ser Glu Val Asn Ser Lys Pro Arg
120           175           180           185
122 AGG GAA AGA ACA GCT TTC ACC AAA GAG CAA ATC AGA GAA CTT GAG GCA      805
123 Arg Glu Arg Thr Ala Phe Thr Lys Glu Gln Ile Arg Glu Leu Glu Ala
124           190           195           200
126 GAG TTC GCC CAT CAT AAC TAT CTG ACC AGA CTG AGA AGA TAT GAG ATA      853
127 Glu Phe Ala His His Asn Tyr Leu Thr Arg Leu Arg Arg Tyr Glu Ile
128           205           210           215
130 GCG GTG AAC CTA GAC CTC ACT GAA AGA CAG GTG AAA GTG TGG TTC CAG      901
131 Ala Val Asn Leu Asp Leu Thr Glu Arg Gln Val Lys Val Trp Phe Gln
132 220           225           230           235
134 AAC AGG AGA ATG AAG TGG AAG CGG GTC AAG GGG GGA CAA CAA GGA GCT      949
135 Asn Arg Arg Met Lys Trp Lys Arg Val Lys Gly Gly Gln Gln Gly Ala

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136          240          245          250
138 GCA GCC CGA GAA AAG GAA CTG GTG AAT GTG AAA AAG GGA ACA CTT CTT      997
139 Ala Ala Arg Glu Lys Glu Leu Val Asn Val Lys Lys Gly Thr Leu Leu
140          255          260          265
142 CCA TCA GAG CTG TCA GGA ATT GGT GCA GCC ACC CTC CAG CAG ACA GGG      1045
143 Pro Ser Glu Leu Ser Gly Ile Gly Ala Ala Thr Leu Gln Gln Thr Gly
144          270          275          280
146 GAC TCA CTA GCA AAT GAC GAC AGT CGC GAT AGT GAC CAC AGC TCT GAG      1093
147 Asp Ser Leu Ala Asn Asp Asp Ser Arg Asp Ser Asp His Ser Ser Glu
148          285          290          295
150 CAC GCA CAC TTA TGATACATAC AGAGACCAGC TCCGTTCTCA GGAAAGCACC      1145
151 His Ala His Leu
152 300
154 ATTGTGATGG CAAATCTCAC CCAAACATCG TTTACATGGC AGATGACTGT GGCAGTGTGG      1205
156 CTTAATATAA TTAAACGCAG GCATCTCAAG TCTGTTTCTC ATGATTGATA GAAGGTTTAC      1265
158 ACTAAGTGCC TCTTATTGAA GATGCTTCCA CAGTGAATG GGAGAAAGTG AACATATCTA      1325
160 AATATACTTG TTCCTTATAT GACAGAGAGG GAGATGAATG TTTGCTTTGG CTTGCACTGA      1385
162 AAATTAAATT GCTACCAAGA GCAAACCTCG TAAGACATTT TGA CTCAAGT TGTCTCCAGA      1445
164 GTGAAGATGT TATAGAAATG CTTTGAACAT TCCAGTTGTA CCAGGTCATG TGTGTGACAC      1505
166 TGGGCAGGTA TTTGCTTTTG CTTGCACTGA AACTTAAACT GCTATCAAGT TAACCCATGA      1565
168 AATAGTTTAT CTTGAACAGC CACAGTGCCT GAAATCACCA AGTGGATATA AAATGAACTG      1625
170 AAATTCTGTA TATATTACTC CTAAGTCATT TTCCTGTCTT CACTAATTTT AGCAAATGCA      1685
172 TTCATATTAG CTGATGAAAA TAGGCTTTCC CGTGGACAAA TGCAGCCAGC TTCTTGTATT      1745
174 TTTATACATT TTTTGTGTCAG TCAGAGACAT CAGTATGTGC TTA CTGTGT TCAAGTAGAG      1805
176 GAAATGCAGT AGAGTCTGAT AGGACATATT CTTGGTACCA CAGACAAAAC AAATCTTCTG      1865
178 TTGCATTGAC TATCAACTGC TGCAGATACA TTAGAGAACA CACCTAGCCC CCCTCCAGCC      1925
180 TCCCTCTGTT ATCGCTCGAA GACATTAGCG TCATAGGCAA GTAGTTACCT TGCCAAATGA      1985
182 GTCTTGTGTG GCAGATGTCT GATTTTGTAT CTTTAAACTG TTAATGGTAT GTGTCTGCTT      2045
184 CAGTTAACAG GGAAAAAGAT TTCTTCCTCA TTGTTTATGA TACAAAACCC AAGTGCCAAA      2105
186 CAAAGCTAGT TCTTCAAGGG ATAGATGAGA AACTGAATGT CTGACAAGTA GACTCAGCGA      2165
188 AAATACATTA TTTTTCAGAG GCTGTGTATT CATGCAGTAC AAGTCCTTGT ATTTTGTAAA      2225
190 AAAAAAAGTT AAATAAATG      2244
193 (2) INFORMATION FOR SEQ ID NO: 2:
195 (i) SEQUENCE CHARACTERISTICS:
196 (A) LENGTH: 303 amino acids
197 (B) TYPE: amino acid
198 (D) TOPOLOGY: linear
200 (ii) MOLECULE TYPE: protein
202 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:
204 Met Glu His Pro Leu Phe Gly Cys Leu Arg Ser Pro His Ala Thr Ala
205 1 5 10 15
207 Gln Gly Leu His Pro Phe Ser Gln Ser Ser Leu Ala Leu His Gly Arg
208 20 25 30
210 Ser Asp His Met Ser Tyr Pro Glu Leu Ser Thr Ser Ser Ser Ser Cys
211 35 40 45
213 Ile Ile Ala Gly Tyr Pro Asn Glu Glu Gly Met Phe Ala Ser Gln His
214 50 55 60
216 His Arg Gly His His His His His His His His His His His Gln
217 65 70 75 80

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219 Gln Gln Gln His Gln Ala Leu Gln Ser Asn Trp His Leu Pro Gln Met
220           85           90           95
222 Ser Ser Pro Pro Ser Ala Ala Arg His Ser Leu Cys Leu Gln Pro Asp
223           100           105           110
225 Ser Gly Gly Pro Pro Glu Leu Gly Ser Ser Pro Pro Val Leu Cys Ser
226           115           120           125
228 Asn Ser Ser Ser Leu Gly Ser Ser Thr Pro Thr Gly Ala Ala Cys Ala
229           130           135           140
231 Pro Arg Asp Tyr Gly Arg Gln Ala Leu Ser Pro Ala Glu Val Glu Lys
232 145           150           155           160
234 Arg Ser Gly Ser Lys Arg Lys Ser Asp Ser Ser Asp Ser Gln Glu Gly
235           165           170           175
237 Asn Tyr Lys Ser Glu Val Asn Ser Lys Pro Arg Arg Glu Arg Thr Ala
238           180           185           190
240 Phe Thr Lys Glu Gln Ile Arg Glu Leu Glu Ala Glu Phe Ala His His
241           195           200           205
243 Asn Tyr Leu Thr Arg Leu Arg Arg Tyr Glu Ile Ala Val Asn Leu Asp
244           210           215           220
246 Leu Thr Glu Arg Gln Val Lys Val Trp Phe Gln Asn Arg Arg Met Lys
247 225           230           235           240
249 Trp Lys Arg Val Lys Gly Gly Gln Gln Gly Ala Ala Ala Arg Glu Lys
250           245           250           255
252 Glu Leu Val Asn Val Lys Lys Gly Thr Leu Leu Pro Ser Glu Leu Ser
253           260           265           270
255 Gly Ile Gly Ala Ala Thr Leu Gln Gln Thr Gly Asp Ser Leu Ala Asn
256           275           280           285
258 Asp Asp Ser Arg Asp Ser Asp His Ser Ser Glu His Ala His Leu
259           290           295           300

```

262 (2) INFORMATION FOR SEQ ID NO: 3:

264 (i) SEQUENCE CHARACTERISTICS:

265 (A) LENGTH: 941 base pairs

266 (B) TYPE: nucleic acid

267 (C) STRANDEDNESS: both

268 (D) TOPOLOGY: linear

270 (ii) MOLECULE TYPE: cDNA

272 (iii) HYPOTHETICAL: NO

274 (iv) ANTI-SENSE: NO

277 (ix) FEATURE:

278 (A) NAME/KEY: CDS

279 (B) LOCATION: 33..941

282 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

```

284 GTCTTCTACC TGGAACCCGA AACTTGCATG CT ATG GAA CAC CCG CTC TTT GGC      53
285           Met Glu His Pro Leu Phe Gly
286           1           5
288 TGC CTG CGC AGC CCT CAC GCC ACG GCG CAA GGC TTG CAC CCG TTC TCC      101
289 Cys Leu Arg Ser Pro His Ala Thr Ala Gln Gly Leu His Pro Phe Ser
290           10           15           20
292 CAA TCC TCT CTC GCC CTC CAT GGA AGA TCT GAC CAT ATG TCT TAC CCC      149
293 Gln Ser Ser Leu Ala Leu His Gly Arg Ser Asp His Met Ser Tyr Pro

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294	25	30	35	
296	GAG CTC TCT ACT TCT TCC TCA TCT TGC ATA ATC GCG GGA TAC CCC AAC	197		
297	Glu Leu Ser Thr Ser Ser Ser Ser Cys Ile Ile Ala Gly Tyr Pro Asn			
298	40 45 50 55			
300	GAA GAG GAC ATG TTT GCC AGC CAG CAT CAC AGG GGG CAC CAC CAC CAC	245		
301	Glu Glu Asp Met Phe Ala Ser Gln His His Arg Gly His His His His			
302	60 65 70			
304	CAC CAC CAC CAT CAC CAC CAT CAG CAG CAG CAG CAC CAG GCT CTG CAA	293		
305	His His His His His His His Gln Gln Gln Gln His Gln Ala Leu Gln			
306	75 80 85			
308	ACC AAC TGG CAC CTC CCG CAG ATG TCT TCC CCA CCG AGT GCG GCT CGG	341		
309	Thr Asn Trp His Leu Pro Gln Met Ser Ser Pro Pro Ser Ala Ala Arg			
310	90 95 100			
312	CAT AGC CTC TGC CTC CAG CCC GAC TCT GGA GGG CCC CCA GAG TTG GGG	389		
313	His Ser Leu Cys Leu Gln Pro Asp Ser Gly Gly Pro Pro Glu Leu Gly			
314	105 110 115			
316	AGC AGC CCG CCC GTC CTG TGC TCC AAC TCT TCC AGC TTG GGC TCC AGC	437		
317	Ser Ser Pro Pro Val Leu Cys Ser Asn Ser Ser Ser Leu Gly Ser Ser			
318	120 125 130 135			
320	ACC CCG ACT GGG GCC GCG TGC GCG CCG GGG GAC TAC GGC CGC CAG GCA	485		
321	Thr Pro Thr Gly Ala Ala Cys Ala Pro Gly Asp Tyr Gly Arg Gln Ala			
322	140 145 150			
324	CTG TCA CCT GCG GAG GCG GAG AAG CGA AGC GGC GGC AAG AGG AAA AGC	533		
325	Leu Ser Pro Ala Glu Ala Glu Lys Arg Ser Gly Gly Lys Arg Lys Ser			
326	155 160 165			
328	GAC AGC TCA GAC TCC CAG GAA GGA AAT TAC AAG TCA GAA GTC AAC AGC	581		
329	Asp Ser Ser Asp Ser Gln Glu Gly Asn Tyr Lys Ser Glu Val Asn Ser			
330	170 175 180			
332	AAA CCC AGG AAA GAA AGG ACA GCA TTT ACC AAA GAG CAA ATC AGA GAA	629		
333	Lys Pro Arg Lys Glu Arg Thr Ala Phe Thr Lys Glu Gln Ile Arg Glu			
334	185 190 195			
336	CTT GAA GCA GAA TTT GCC CAT CAT AAT TAT CTC ACC AGA CTG AGG CGA	677		
337	Leu Glu Ala Glu Phe Ala His His Asn Tyr Leu Thr Arg Leu Arg Arg			
338	200 205 210 215			
340	TAC GAG ATA GCA GTG AAT CTG GAT CTC ACT GAA AGA CAG GTA AAA GTC	725		
341	Tyr Glu Ile Ala Val Asn Leu Asp Leu Thr Glu Arg Gln Val Lys Val			
342	220 225 230			
344	TGG TTC CAA AAC AGG CGG ATG AAG TGG AAG AGG GTA AAG GGT GGA CAG	773		
345	Trp Phe Gln Asn Arg Arg Met Lys Trp Lys Arg Val Lys Gly Gly Gln			
346	235 240 245			
348	CAA GGA GCT GCG GCT CGG GAA AAG GAA CTG GTG AAT GTG AAA AAG GGA	821		
349	Gln Gly Ala Ala Ala Arg Glu Lys Glu Leu Val Asn Val Lys Lys Gly			
350	250 255 260			
352	ACA CTT CTC CCA TCA GAG CTG TCG GGA ATT GGT GCA GCC ACC CTC CAG	869		
353	Thr Leu Leu Pro Ser Glu Leu Ser Gly Ile Gly Ala Ala Thr Leu Gln			
354	265 270 275			
356	CAA ACA GGG GAC TCT ATA GCA AAT GAA GAC AGT CAC GAC AGT GAC CAC	917		
357	Gln Thr Gly Asp Ser Ile Ala Asn Glu Asp Ser His Asp Ser Asp His			
358	280 285 290 295			

VERIFICATION SUMMARY

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L:27 M:220 C: Keyword misspelled or invalid format, [(A) APPLICATION NUMBER:]

L:28 M:220 C: Keyword misspelled or invalid format, [(B) FILING DATE:]